CLAIMS

What is claimed is:

1. An apparatus, comprising:

a multilayer structure having an antiferromagnetic layer between a first and second layer, the antiferromagnetic layer having exchange anisotropy that helps pin the magnetization direction of the first layer and helps pin the magnetization direction of the second layer.

2. The apparatus of claim 1 wherein said magnetization direction of said first layer is antiparallel to said magnetization direction of said second layer.

3. The apparatus of claim 1 wherein said first layer neighbors said antiferromagnetic layer.

4. The apparatus of claim 1 wherein said second layer neighbors said antiferromagnetic layer.

5. The apparatus of claim 1 wherein said first and second layers neighbor said antiferromagnetic layer, said multilayer structure part of a larger multilayer structure having a free layer, said first layer a pinned layer, said second layer a pinned keeper layer, said pinned layer producing first pole densities and resulting first field that are approximately canceled by a second field within said free layer resulting from second pole densities produced by said pinned keeper layer.

6. The apparatus of claim 5 wherein the resistance associated with each of the layers of said larger multilayer structure is such that most of the current flow through said sensor flows through said antiferromagnetic layer.

7. The apparatus of claim 6 wherein said current flow is centered along the thickness of said antiferromagnetic layer.

8. The apparatus of claim 5 wherein the resistance associated with each of the layers of said larger multilayer structure are such that more current flows through said sensor outside said antiferromagnetic layer than inside said antiferromagnetic layer.

9. The apparatus of claim 8 wherein said antiferromagnetic layer material is an oxide.

10. The apparatus of claim 5 wherein said pinned layer and/or said pinned keeper layer is a hard magnetic layer.

11. An apparatus, comprising:

a) a disk; and

b) a head configured to be disposed over said disk, said head comprising, a multilayer structure having an antiferromagnetic layer between a first and second layer, the antiferromagnetic layer having exchange anisotropy that helps pin the magnetization direction of the first layer and helps pin the magnetization direction of the second layer.

12. The apparatus of claim 1 wherein said magnetization direction of said first layer is antiparallel to said magnetization direction of said second layer.

13. The apparatus of claim 1 wherein said first layer neighbors said antiferromagnetic layer.

14. The apparatus of claim 1 wherein said second layer neighbors said antiferromagnetic layer.

15. The apparatus of claim 1 wherein said first and second layers neighbor said antiferromagnetic layer, said multilayer structure part of a larger multilayer structure having a free layer, said first layer a pinned layer, said second layer a pinned keeper layer, said pinned layer producing first pole densities and resulting first field that are approximately canceled by a second field within said free layer resulting from second pole densities produced by said pinned keeper layer.

16. The apparatus of claim 5 wherein the resistance associated with each of the layers of said larger multilayer structure is such that most of the current flow through said sensor flows through said antiferromagnetic layer.

17. The apparatus of claim 6 wherein said current flow is centered along the thickness of said antiferromagnetic layer.

18. The apparatus of claim 5 wherein the resistance associated with each of the layers of said larger multilayer structure are such that more current flows through said sensor outside said antiferromagnetic layer than inside said antiferromagnetic layer.

19. The apparatus of claim 8 wherein said antiferromagnetic layer material is an oxide.

20. A method comprising:

cooling a multilayer structure having an antiferromagnetic layer from a temperature above an antiferromagnetic blocking temperature to a temperature below said antiferromagnetic blocking temperature while a first magnetic field is established within a first layer to pin the magnetization direction of said first layer and while a

second magnetic field is established within a second layer to pin the magnetization direction of said second layer.

21. The method of claim 20 wherein said first field is antiparallel to said first field.

22. The method of claim 21 wherein said first and second fields are formed by directing a current through said multilayer structure, said first and second fields antiparallel to each other.

23. The method of claim 21 wherein said first and second fields are at least partially formed by directing more current outside said multilayer structure than inside said multilayer structure.

24. The method of claim 23 further comprising applying an external magnetic field, said external magnetic field fully forming said first and second magnetic fields when combined with fields produced by said current.